

Does the Organization Matter?

A Multilevel Analysis of Organizational Effects in Homeless Service Innovations

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Statement of the Research Problem

Approximately 1.6 million individuals sought homeless shelter services on any given night in the United States in 2008 (Department of Housing and Urban Development [HUD], 2009). In the 2009 fiscal year, U.S. Congress allocated \$1.636 billion in Homeless Assistance Grants to HUD alone (HUD). While there has long been recognition of the need to improve service effectiveness (HUD; North, Pollio, Perron, Eyrich, & Spitznagel, 2005; Wright, Rubin, & Devine, 1998), there remains a dearth of research examining the organizations serving homeless individuals and families. The adoption of new technologies is critical to understanding the role of the organization. Many human service organizations are slow and resistant to adopt new technologies (Carrilio, 2005; 2007; Fitch, 2005), yet the effectiveness of innovations is contingent upon how well organizations support their implementations (Glisson & Schoenwald, 2005). Moreover, organizational culture has been shown to influence the technology implementation (Carrilio, Packard, & Clapp, 2003; Racine, 2006) and client outcomes (McCoy & Vila, 2002). The purpose of this study is to examine how organizational culture influences staff members' use of new technologies in homeless services to determine whether innovation dissemination is partly a function of organizational culture.

Research Background

Research on homeless services typically focuses on clients and is derived from the premise that homeless persons face a unique constellation of problems (North et al., 2005) including co-occurring disabilities, limited social and familial connections, and a distrust of traditional social services (Wright, Rubin, & Devine, 1998). It is implied that these factors make it difficult for clients to access services. This assumption may be misleading, however. Studies of client utilization of services have shown that the

availability of services, rather than client efforts to access the services, was a primary predictor of client utilization (North & Smith, 1993; Padgett, Struening, & Andrews, 1990). Homeless individuals have reported that pleasant staff members and surroundings are instrumental in helping them to remain in supportive housing (Padgett, Henwood, Abrams, & Davis, 2008). In addition, research shows that organizational characteristics such as size and leadership affect care coordination (Calloway & Morrissey, 1998; Tessler, Rosenheck, & Gamache, 2001), service intensity (Sosin, 2001), and service use (North et al., 2005).

In 1999, HUD introduced a new technology, homeless service information systems (HMIS), that facilitate the migration from paper-based to electronic work systems and are designed to improve the efficiency of service delivery and effectiveness of homeless interventions (HUD, 2007). HMIS typically link multiple service providers through secure, central databases using encrypted Internet communication. Organizations store client records in the database and coordinate client care through real-time, shared access. Successful implementation means that organizations consistently enter client information into an HMIS and record services delivered. As of 2006, 91% of homeless service provider communities in the U.S. reported that they were collecting client-level data in an HMIS (HUD). What is not clear, however, is the degree to which the staff members are actually using the system. Preliminary evaluations of HMIS use show that many staff members use the system sporadically (Cronley & Patterson, in press) and organizations vacillate between high and low usage (Gutierrez & Friedman, 2005).

In order for organizations to use the HMIS more consistently, the organizational culture must support technology (Carrilio, Packard, & Clapp, 2003; Pasmore, Francis, Haldeman, & Shani, 1982; Racine, 2006; Trist & Beyer, 1951). Organizational culture incorporates both structure (e.g., size and levels of authority) and ideology (e.g., openness to change). The collection of individuals in an organization creates norms, values, and expectations of the work environment that influence how individuals act (Deshpande & Webster, 1989; Homburg & Pflesser; Schein, 1992), and can be measured as the behavioral expectations reported by members of the organization (Glisson, 2002). Organizational culture includes three parts: 1) artifacts, 2) articulated values and beliefs, and 3) underlying assumptions (Schein). The values and beliefs guide behavioral expectations, but they may not translate into action if they contradict underlying assumptions. Some studies, though, have suggested that culture is transmitted among employees more through behavioral expectations than through “deeper” assumptions (Ashkanasy, Broadfoot, & Falcus, 2000; Hofstede, 1998; Hofstede, et al., 1990). Individuals can comply with behavioral expectations without internalizing the assumptions that contribute to those expectations. Alternatively, expectations can be determined by the demands that workers face on the job, regardless of the values of top management (Hemmelgarn, Glisson, & Dukes, 2001).

Research Hypotheses

The current study is a multilevel, exploratory analysis of organizational culture and staff members' use of an HMIS. It is intended to examine how staff members nested within organizations behave differently based on their organizational affiliation. Organizational culture characteristics were captured at one point in time in order to explain the frequency of HMIS use by staff members during the previous year. It was hypothesized that 1) culture would vary by organization; and 2) staff members in organizations with different culture characteristics would log on to the HMIS at differential rates.

Methodology

Sample

The study employed a purposive sample drawn from two sampling frames: 1) the East Tennessee Coalition to End Homelessness (ETCEH); and 2) the Michigan Coalition Against Homelessness (MICAHA). ETCEH is a coalition of multiple homeless service providers, defined by HUD as a Continuum of Care (CoC). The ETCEH CoC, in partnership with the University of Tennessee, operates its own HMIS, independent of other CoC in the state. Seven of the eight organizations in the ETCEH participated. MICAHA is a statewide coalition that administers a single HMIS used by multiple CoCs; three CoCs chose to participate in the study, one rural and two urban. In the rural CoC, eight out of the nine organizations using the HMIS participated. In the first urban CoC, five out of the 11 organizations using the HMIS participated in the study. In the second urban CoC, six out of the 14 organizations participated. Organizations chose not to participate for various reasons. In the rural CoC, a single organization, which serves domestic violence victims, declined to participate based on privacy concerns for its clients. Some stated that their staff members were too busy. Other organizations had only one or two staff members so it was not possible to measure organizational culture at these locations. Finally several organizations did not respond to repeated phone calls and emails.

In the final sample, level one included 142 staff members (77% female; 36% from Tennessee). Staff members were nested in 24 organizations (seven in Tennessee) at level two. These organizations were divided among emergency shelters (n=3), transitional housing (n=6), permanent housing (n=7) and ancillary services (n=10). Organizations were nested in four CoCs (the ETCEH and three from MICAHA). See Figure 1 for the nested design.

Data Collection

The study relied on HMIS archival data to measure HMIS use over two, multiple-month periods (Mar.1, 2007 – Dec., 31, 2007 for ETCEH and Jan. 1, 2008 – Dec. 31, 2008 for MICAH). HMIS software assigns a unique identifier to all staff members who use the system. Each time that a staff member logs on, the software records the date and the user's activities such as new clients added and services recorded. An HMIS report was created that included HMIS use among staff members, organizational affiliation, CoC, and gender. HMIS data from ETCEH and MICAH were collapsed into one data set.

Organizational culture data were collected by surveying staff members at participating organizations, using the Organizational Social Context (OSC) questionnaire (Glisson et al., 2008), described below. Culture was measured once at each organization (during January or February 2008 for ETCEH and during April or May 2009 for MICAH). Staff members completed the OSC independently, and no supervisors were present during the testing. Organizations did not see staff members' individual responses. Again, data from both ETCEH and MICAH were collapsed into the level two data set.

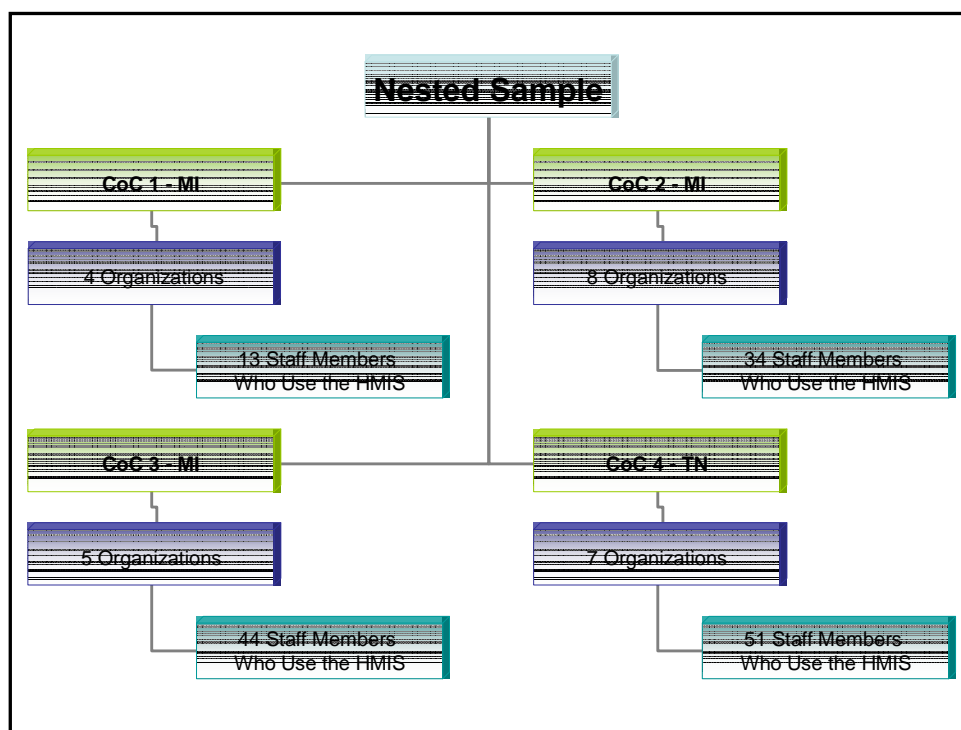


Figure 1. Nested relationships among sample levels. The diagram shows the three levels of clustering - CoC, organizational, and staff member (HMIS user).

Measurement

The outcome, staff members' use of an HMIS, was measured according to the number of times that each staff member logged on over the multiple-month period. In some organizations, only a single individual used the HMIS during the year of data collection. These individuals and their organizations were still included in the multilevel model, one advantage of which is that it accounts for uneven designs when higher order groups have different numbers of cases in the lower order groups (Raudenbush & Bryk, 2002). An exposure variable, the number of months that a staff member had any registered activity for the HMIS was measured to account for the opportunity, or amount of time, that an individual had to use the system. The study included gender as a level one predictor to control for gender differences in perceptions of the work environment (Kanter, 1977) such as stressors (Arrington, 2008; Coffey, Dugdill, & Tattersall, 2009) and job competencies (Frame, Roberto, Schwab, & Harris, 2010).

The study measured the level two predictor, organizational culture, using the OSC (Glisson et al., 2008). The OSC consists of 105 items and measures three dimensions: (1) culture, (2) climate, and (3) work attitudes (Glisson & James, 2002). Analysis was limited to the culture scale and its corresponding sub-scales: 1) *rigidity* (14 items, $\alpha_1^1=0.79$, $\alpha_2^2=0.74$), which is the degree of order and flexibility in work habits and procedures; 2) *proficiency* (15 items, $\alpha_1=0.86$, $\alpha_2=0.85$), defined as the degree to which staff members are expected to be knowledgeable about and capable of providing optimal services; and 3) *resistance* (13 items, $\alpha_1=0.79$, $\alpha_2=0.70$), the ability of the environment to change work habits and procedures.

Data Analysis

The analysis used a two-level hierarchical generalized linear model (HGLM) (Raudenbush & Bryk, 2002) with a negative binomial log-link function to consider the cross-level relationship between staff members' HMIS use and organizational culture. Although the model included three-levels, the small number of CoCs in the third level ($n=4$) meant that it was not tenable to test the variation at this level. Thus, a two-level model was tested. The negative binomial model accounted for the overdispersion ($X^2 = 447.92$, $p = .00$) in the data (Orme & Combs-Orme, 2009). In addition, the multi-level model accounted for the clustering in the data (Nair, Czaja, & Sharit, 2007; Raudenbush & Bryk, 2006). The analysis estimated a rate of HMIS logon attempts for staff members based on the number of times that they attempted to logon (the outcome variable) adjusted for the number of months that they had used the system (the exposure variable). Restricted maximum likelihood estimation was used rather than full maximum likelihood

¹ Refers to the ETCEH sample

² Refers to the MICAH sample

estimation, because the former is considered less biased than the latter with small samples (Nair, Czaja, & Sharit, 2007). A test of the null model, including only the outcome and exposure variables, indicated that there was random variation among organizations in frequency of HMIS logon attempts ($X^2 = 89.93$, $p = .00$).

The full model included: 1) *number of months use* (exposure variable); 2) *proficiency* and *rigidity* at level two³; 3) *gender* at level one; and 4) the cross-level interactions by gender (i.e., , *proficiency X gender* and *rigidity X gender*). The interaction between rigidity and gender was not statistically significant and did not improve the model fit. Consequently, it was not included in the final model. The full model is specified as shown in Equation 1 below.

$$\eta_{ij} = \gamma_{00} + \gamma_{01}(\text{dd}) + \gamma_{02}(\text{proficiency}) + \gamma_{03}(\text{rigid}) + \gamma_{04}(\text{ddXrigidity}) + \gamma_{10}(\text{gender}) + \gamma_{11}(\text{proficiencyXgender}) + \mu_{0j} + r_{ij} [1]$$

Where η_{ij} is the log of the monthly rate of HMIS logon attempts for staff member i in organization j . γ_{00} is the average rate of new client entry for a staff member. $\gamma_{01}(\text{dd})$ is the difference in HMIS logon attempts between organizations with a disproportionate data entry system and those without. $\gamma_{02}(\text{proficiency})$ is the one point change in HMIS entry for every one point increase in organizational proficiency. $\gamma_{03}(\text{rigidity})$ is the one point change in HMIS entry for every one point increase in organizational rigidity. $\gamma_{04}(\text{ddXrigidity})$ is the one point change in the rate of HMIS logon attempts as a function of the interaction between organizational rigidity and disproportionate data entry. $\gamma_{10}(\text{gender})$ is the difference in logon attempts for males and females. $\gamma_{11}(\text{proficiencyXgender})$ is the one point change in the rate of HMIS logon attempts as a function of the interaction between organizational proficiency and gender. μ_0 is the random variation among organizations, and r_{ij} is the random variation among staff members.

Results

Organizational Culture

Results showed substantial intra and inter-variability in organization culture. Each organization received a T-score for proficiency, rigidity, and resistance. Figures 2 and 3 show the differences both within the sample and between the sample and the normative national sample of children's mental health providers. The mean proficiency score ($M=58.11$, $s.d.=7.73$) indicates that the average homeless service provider was almost a full standard deviation higher on proficiency than the average children's mental health provider in the normative sample. Mean scores for rigidity ($M=60.39$, $s.d.=7.05$) and resistance ($M=64.11$, $s.d.=7.55$) were more than a full standard deviation above the mean.

³ Resistance was not included in the final model because of its high correlation with rigidity ($r=0.603$, $p<.001$).

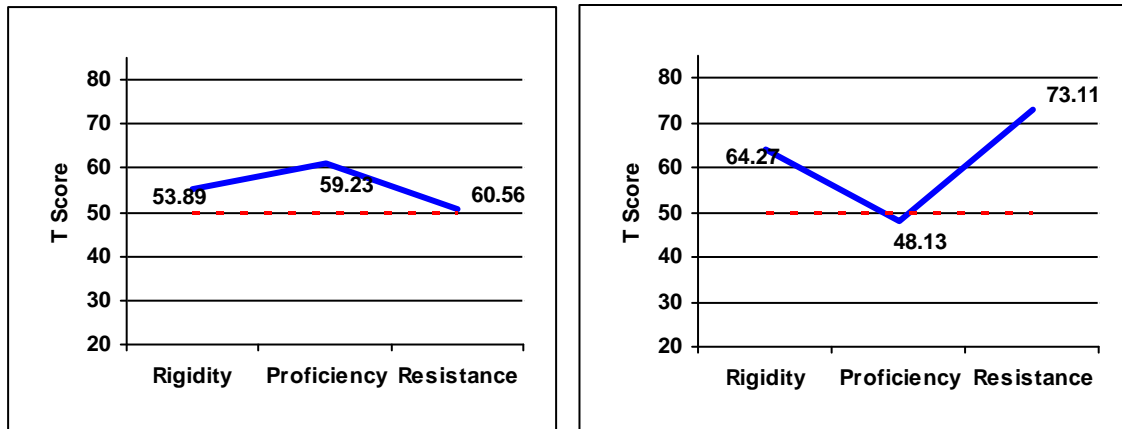


Figure 2. *A comparison of inverse extreme organizational culture profiles. The left figure shows organizations scoring very high on proficiency but low on rigidity and resistance, organizations where innovations may be more successful. The figure on the right shows organizations with low proficiency but very high rigidity and resistance. In these organizations, innovations may face challenges.*

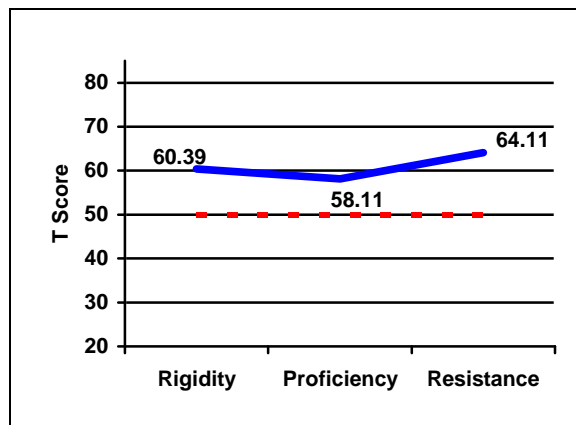


Figure 3. *Organizational culture averages from the homeless service provider sample (n = 24) compared to the national sample (n = 100).*

Multilevel Model

Results for the model are reported in Table 1. While there were no significant main effects of proficiency or rigidity on use of HMIS, there was a significant main effect for gender, and women were more likely to use an HMIS than men ($B=-5.196$, $ERR=0.006$, $p=0.016$). This finding may be misleading, however, due to the disparity between men ($n=33$) and women ($n=109$) in the sample. A comparison of median HMIS logon attempts shows that men logged on more frequently than women (66 vs. 46 logon

attempts). In addition, there was a significant interaction effect between proficiency and gender ($B = .033$, $ERR = 1.085$, $p = .016$) on HMIS use (see Figure 4). For every one standard deviation increase in organizational proficiency, the rate of logon attempts for men increased by a factor of 1.391 (39%). They were more likely to use the HMIS in organizations with higher levels of proficiency. Women on the other hand were just as likely to use an HMIS in high as in low proficiency organizations.

Table 1.

Negative Binomial Hierarchical Generalized Linear Model

Level one ($n = 142$)

Level two ($n = 24$)

<i>Null Model</i>						
Fixed Effect (Unit-specific model with model based standard errors)						
	<i>B</i>	<i>SE</i>	<i>T-ratio</i>	<i>df</i>	<i>ERR</i>	<i>C.I.</i>
Intercept	2.459	0.14	17.592**	23	11.697	8.969, 15.733
Estimation of variance components						
Random effect	<i>s.d.</i>	<i>Variance</i>	<i>Df</i>	<i>X²</i>	<i>p-value</i>	
Intercept	0.496	0.246	23	89.927	0	
Level-one	8.928	79.712				
<i>Full Model</i>						
	<i>B</i>	<i>SE</i>	<i>T-ratio</i>	<i>df</i>	<i>ERR</i>	<i>C.I.</i>
<i>Level two</i>						
Intercept	1.795	1.826	0.983	21	6.017	0.136, 266.746
Proficiency	0.005	0.023	0.229	21	1.005	0.959, 1.054
Rigidity	0.006	0.021	0.289	19	1.006	0.962, 1.052
<i>Level one</i>						
Gender	-4.962	2.129	-2.331*	137	0.007	0.000, 1.467
Gender X Proficiency	0.080	0.034	2.331*	137	1.082	1.016, 1.158
Estimation of variance components						
Random effect	<i>s.d.</i>	<i>Variance</i>	<i>Df</i>	<i>X²</i>		
Intercept	0.531	0.282	21	91.577**		
Level-one	8.988	80.7889				

* significant at $p < .05$

** significant at $p < .01$

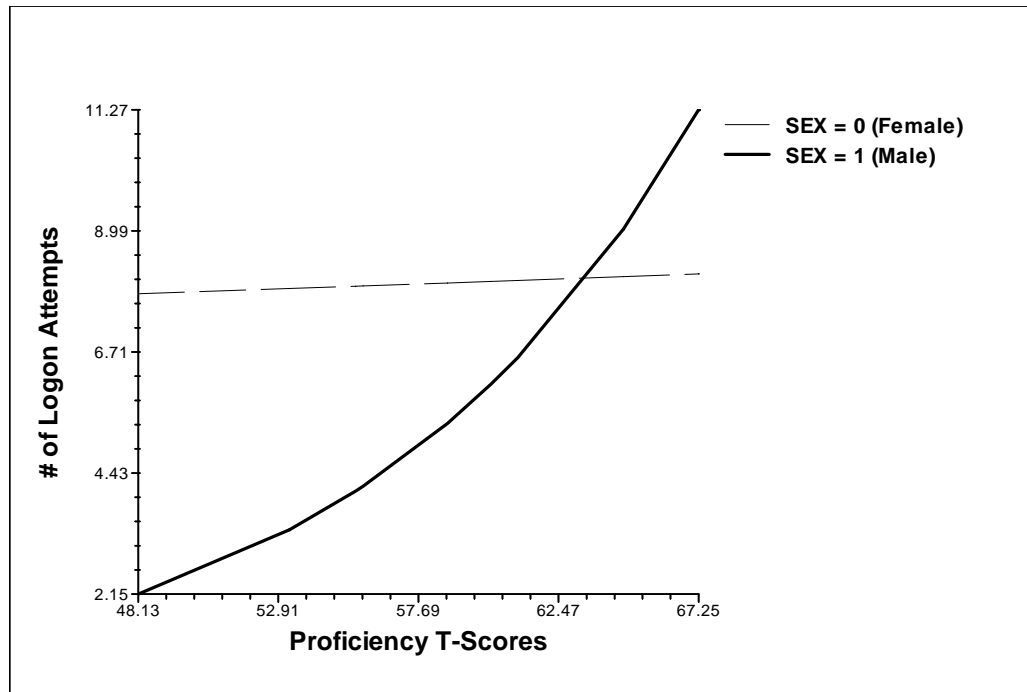


Figure 4. *Line graph showing the interaction between gender and proficiency and its effect on HMIS logon attempts. Proficiency moderates the relationship between gender and logon attempts, meaning that men are more likely to logon to the HMIS in organization with higher proficiency levels, but level of proficiency has not effect on women.*

Utility for Social Work Practice

This study was conceived as an exploration of organizational culture and its effects on the frequency with which staff members use new technology. Despite the fact that over 90% of homeless service providers report that they are using an HMIS, this does not mean that staff members are logging on frequently and entering client data regularly. The most important finding in the current study was that staff members' behaviors were affected by an interaction between organizational context and gender, which confirms prior research on the interaction between individual and organizational level variables (North, et al., 2005). What is particularly interesting is that men appeared to be influenced by the work environment, while women were not. In a national study of social workers in the workplace, Arrington (2008) found that men were more likely than women (22% vs. 18%) to report a decrease in work performance due to job stressors. In addition, men were more likely to define job competencies as actions, such as applying technology skills, while women defined them as communal activities like building relationships (Frame, Roberto, Schwab, & Harris, 2010). Perhaps women's use is less affected by organizational culture because they are less likely to use technology in general due to

stressors in outside of the work environment (Ahuja & Thatcher, 2005). Alternatively, women may log on less frequently but spend more time once logged on entering client data. In general, women advance more slowly in their careers and earn less than their male counterparts in the work environment (Timberlake, 2005). These continued disparities may mean that women experience higher negative consequences for decreased productivity than men and are thus less likely to show a decline in work productivity, regardless of the environment. Further research is necessary to understand more fully why organizational culture affects men's use of HMIS but not women's.

The results also showed substantial differences in organizational culture between homeless service and children's mental health providers. The former were more rigid and resistant than the latter meaning that staff members in homeless services are more likely to follow strict and established policies while interacting with clients and are less comfortable both initiating and accommodating change in the work environment. On the other hand, homeless service providers were more proficient than children's mental health providers suggesting that the work environment emphasizes high quality client care and expects staff members to be trained to provide effective services. These differences suggest that there are distinctly different work environments among human service sectors. Thus, a one-size-fits-all approach to understanding innovations in human services is misguided. For example, the high levels of rigidity and resistance among homeless service providers, compared to children's mental health providers, suggest that disseminating new technologies among homeless service providers may be particularly difficult.

Limitations

The study has several limitations that are common among organizational research including measurement ambiguities (Wilderom, Glunk, & Maslowski, 2000) and a non-random sample (Poertner, 2006). It was challenging to identify one measure of usage that represents all types of interactions with the system. This study chose to use logon attempts as a proxy indicator of use to maximally capture user access of the system. This operationalization may have overestimated use by some individuals who logon frequently but do not input large amounts of data, and underestimated use by other individuals who logon infrequently but input large amounts of detailed data such as case notes and lengthy assessments. The use of this proxy measure of HMIS use may explain why the study failed to find a direct relationship between organizational culture and technology use. For instance, most organizations may be participating at a minimum level, but organizations with specific culture profiles will be more likely to transfer all data keeping to the electronic system quickly and comprehensively. Thus, a measure of data quality might have demonstrated a stronger relationship between organizational culture and technology use.

In addition, the study's findings are not generalizable to all homeless service providers who are using information management systems in the U.S. This study, which to date is the largest of its kind, only included 24 organizations in four CoCs across two states. Results may have overestimated overall levels of proficiency while underestimating rigidity and resistance. It seems logical that organizations' willing to participate in research, compared to those who declined, would be more likely to value proficiency while being less rigid and resistant. In addition, lack of participation by some organizations may have underestimated the variance among organizations in use of the HMIS. Perhaps those organizations, which chose not to participate, are the few organizations that are choosing not to use an HMIS.

Finally, the small number of men compared to women in the sample may have influenced the results. This disparity was inevitable considering the fact that women dominate nonprofit services. In fact, this sample is consistent with a national study of social workers, which found that 80% are female (Whitaker, 2009). Still the interaction effect between men and proficiency may have been overestimated due to the small number of men in the sample.

Implications

Despite the limitations, this study holds important implications for social work research, practice, and policy. It has begun to reveal patterns in the relationships between individual and organizational characteristics that require further consideration. First, it is one of very few studies examining technology implementation as a function of organizational culture (Cronley & Patterson, in press). The study is also unique in its methodology. It relies on a multi-level statistical model to capture nested relationships between organizations and their staff members. Multi-level modeling is still new to social work research, although analyzing grouped data are common in the field (Guo, 2005). By using this model, this study avoids statistical error that can occur from one of the most common violations of assumptions in research with grouped data, lack of independence in observation.

Ultimately, this study suggests that the organization may matter in human services and client outcomes. Despite the small sample and limited power, a statistically significant relationship was found between proficiency, gender, and technology use. Subsequent research is needed to test the theory that practitioners who work in organizations with supportive cultures are more likely to provide consistent and comprehensive services. In addition, future research should consider more fully how the organizational environment affects clients who are receiving services (Harvey, 1989; Levitt, 1972; Yoo & Brooks, 2005; Yoo, Brooks, & Patti, 2007). Clients receive services from practitioners working in organizations, and the act of enhancing organizational culture may affect client outcomes.

In conclusion, the study begins to demonstrate the theoretical and empirical links between organizational social context and technology use. The authors recommend that social work research evaluate programs on multiple levels including the organization, the staff members, and ultimately client outcomes. Too often, policies are drafted and implemented without consideration for the context in which they are being implemented and the potential success of new programs and services. Social services, and homeless services in particular, are unique professional environments that pose challenges to technology use. These challenges include lack of resources such as funding, hardware, software, and time, and preexisting technical knowledge. Understanding the relationship between technology and organizational characteristics enhances policy makers and practitioners' abilities to implement technology more effectively. Additionally, it provides researchers with a new research framework from which to examine organizational use of new technologies and client outcomes.

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